



CLAIMS

1       1. A method to provide maintenance to an electrical power generation facility and/or an  
2       electrical power transmission and distribution network system and apparatus connected to said  
3       system, operated by a Utility, whereby maintenance personnel visit a site where a said apparatus  
4       is located to inspect a condition of said apparatus, and examine information from an information  
5       system, wherein said method comprises the further steps of:

6               having the inspector/repairman examine said apparatus with an inspection means and  
7               prepare a report comprising at least one graphic image of the condition of said apparatus,  
8               receiving at said help desk and Information System the report and graphic image from the  
9       inspector/repairman,

10               finding stored information about said apparatus and/or said system in said Information  
11       System,

12               comparing said stored information with the report and/or graphic image,  
13               making an assessment of the condition of said apparatus and providing a  
14       recommendation for a maintenance measure such as a repair.

15       2. A method according to Claim 1, comprising a step of making a decision for the  
16       inspector/repairman to carry out a repair in consultation with the Help Desk.

17       3. A method according to Claim 1, comprising a step of that the inspector/repairman carries  
18       out a temporary repair in consultation with the Help Desk.

1           4.       A method according to Claim 1, comprising a step of that the repair carried out is  
2        documented by inspector/repairman in consultation with the Help Desk and a report of that  
3        repair is stored in the Information System.

4           5.       A method according to Claim 1, comprising a step of that the inspector/repairman  
5        in consultation with the Help Desk makes a plan to repair a fault at a later time.

6           6.       A method according to Claim 1, comprising a step of that the inspector/repairman  
7        in consultation with the Help Desk documents the plan to repair a fault at a later time in full.

7           7.       A method according to Claim 1, comprising a step of that the plan to repair a fault  
8        at a later time comprises a guaranty.

12           8.       A method according to Claim 1, comprising a step of taking action to place  
13        purchase and/or procurement orders for spare parts and or new equipment.

12           9.       A method according to Claim 1, comprising a step of taking action to place one or  
13        more work orders to procure and schedule work according to a plan for repair to an equipment or  
14        to a part of the power network.

15           10.      A method according to Claim 1, comprising that information about a condition of  
16        an equipment or part of the power network is transmitted at least in part over the Internet.

1           11. A method according to Claim 1, comprising that the Help Desk is implemented as  
2       one or more engineers with mobile communications, mobile computers, and mobile access to  
3       data communication networks including the Internet.

4           12. A method according to Claim 1, is that the Help Desk is implemented further  
5       comprising one or more computer programs of an expert system type configured so as to enable  
6       an inspector/repairman to input information concerning an equipment and retrieve further  
7       technical information about maintenance of the equipment.

13. A method according to Claim 1, comprising the further steps of  
selecting a possible action for a repair or temporary measure such as switching in or out a  
load,

inputting technical details such as an electrical load and/or an electrical configuration to  
one or more computer programs for modelling and/or simulating individual equipment and/or a  
part of a power network according to the possible repair or temporary measure,  
examining the modelling result and appraising the merits of the possible repair or  
temporary measure.

14. A method according to Claim 13, comprising the further steps of modelling an  
effect of any of; disconnecting lines, disconnection of a complete or partial of load,  
reconfiguring the power network by for example disconnecting one switch and connecting  
another, operation of an equipment such as a transformer at reduced load, operation of an

1 equipment such as a transformer at increased load.

2 15. A method according to Claim 13, comprising the further step of evaluating a  
3 possible result of a maintenance action such as:  
4 a consequence for electrical power consumers, and  
5 a reduction of life-time (service life or average service life) of a component.

6 16. A method according to Claim 1, comprising the step of receiving from the Utility  
7 notice of a condition of an equipment or part of the power network.

8 17. A method according to Claim 1, comprising the step of receiving from the power  
9 network information reporting a condition of an equipment or part of the power network.

10 18. A method according to Claim 17, comprising the step of receiving from the power  
11 network information reporting a condition of an equipment or part of the power network  
12 dependent on an analysis of a signal from a camera at a site or other location of the power  
13 network.

1        19. A power system information system to provide maintenance for an electrical  
2        power generation, transmission and distribution system and apparatus connected to said power  
3        system, said Information System comprising one or more databases, and communication links to  
4        maintenance personnel located elsewhere, wherein said information system comprises:

5            an engineering/service Help Desk,

6            mobile inspection means to make a graphic image for an inspection report,

7            communication means at the Help Desk to receive a inspection report comprising a

8            graphic image,

9            display means at the Help desk to examine the report and/or the graphic image,

10            mobile terminal, computer and display mans to retrieve information from the one or more  
11            databases,

12            computer and display means to compare the graphic image and/or inspection report with  
13            retrieved information.

14        20. A power system information system according to Claim 19, in which the  
15        inspection means comprises a web camera arranged to send pictures in a format such as TCP/IP  
16        suitable for transmission over a network such as the Internet.

17        21. A power system information system according to Claim 19, which comprises a  
18        communication means enabling two-way voice communication between an inspector at a site  
19        and the Help Desk.

1                   22. A power system information system according to Claim 19, which comprises  
2                   storage means to document details of a decision to provide maintenance service.

3           23. A power system information system according to Claim 19, which comprises  
4        reporting and storage means to document details of a plan to provide maintenance service at a  
5        later time.

6                   24. A power system information system according to Claim 23, which comprises  
7 ordering and scheduling means to issue purchase orders and work orders in respect of the plan to  
8 provide maintenance service at a later time.

25. A power system information system according to Claim 19, which comprises computer program and/or software means to match a identified apparatus to details of the apparatus stored as files in a database of the system, the files comprising any of text, graphic, interactive multimedia, a sound recording.

13            26. A power system information system according to Claim 19, which comprises  
14            software means to log-on a registered or identified representative of the Utility to examine  
15            operations of the power system information database.

16 27. A power system information system according to Claim 19, which comprises  
17 software means to log-on a registered or identified representative of the Utility to examine

1 operations of the engineering Help Desk in real time.

2        28. A power system information system according to Claim 19, which comprises  
3 computer program and/or software means to model and or simulate an effect on the power  
4 system of any of the following: a disconnection; a partial disconnection; a reconfiguring or  
5 switching in of one part and switching out of another part; an increased load on an equipment; a  
6 reduced load on an equipment.

7        29. Use of a system according to Claims 19-28 to provide a condition monitoring  
8 system to monitor the condition of a location for an equipment of a power generation,  
9 transmission and distribution system.

10 30. Use of a system according to Claims 19-28 to provide a maintenance service to a  
power generation, transmission and distribution system.

12 31. Use of a system according to Claims 19-28 to provide maintenance service for a  
13 power generation, transmission and distribution system associated with an type of industrial  
14 plant as diverse as plants such as an airport, a hospital, a paper mill, a petroleum refinery or a  
15 vehicle assembly plant.

1           32. A computer program product comprising computer code means or software code  
2        portions to make a computer or a processor operate in Information System comprising one or  
3        more databases and a Help Desk to provide maintenance for an electrical power generation,  
4        transmission and distribution system and apparatus connected to said power system, wherein  
5        said computer or processor is made to carry out actions to provide maintenance for said power  
6        system including to:

7           receive a data input representing at least one maintenance report,

8           match the data input to an apparatus connected to a Power System network with

9        information stored in a database,

10          receive a second input documenting a maintenance repair action,

11          link the second documented repair action to the apparatus and network,

12          store the documented repair action.

13           33. A computer program product according to Claim 32, which comprises software  
14        means for carrying out a further action to:

15          update status reports for the apparatus and network.

16           34. A computer program product according to Claim 32, which comprises software  
17        means for carrying out a further action to:

18          send a signal in the form of a purchase order comprising details for replacement

19        apparatus of spare parts to a parts supplier.

1                   35.     A computer program product according to Claim 32, which comprises software  
2     means for carrying out a further action to:

3 send a signal comprising details for work orders dependent on the documented repair  
4 action to a maintenance Service Provider company (3).

5           36.     The computer program code element of Claim 32, which comprises computer  
6     code means or software code portions including executable parts formed written as one or more  
7     object oriented programs and accessible and implementable over a network such as the Internet.

1           37. A computer program contained in a computer readable medium, comprising  
2 computer program code means to make a computer or processor carry out the steps according to  
3 any of Claims 1-18 or Claims 32-36.

1           38. A web site comprising means for providing access to a database of a Power  
2           System Information System, which database includes information about an electrical power  
3           generation, transmission and distribution system and apparatus connected to said power system,  
4           which web site comprises computer program means interoperable with means such as HTML,  
5           cHTML, XHTML or XML compatible code wherein in said web site includes computer program  
6           means for executing actions to carry out any of the methods of Claims 1-18.

7        39. A web site according to Claim 38, further comprising software means for  
8 executing actions to issue or receive electronic document orders for apparatus such as spare parts  
9 which documents conform to one or more standards for electronic document interchange EDI  
10 such as EDIFACT, ASC X12, or other standards such as XHTML 1.0, DOM level 3,  
11 SWIFT EDI.

1           40. A first computer data signal embodied for communication in a computerised  
2       system, the communication being associated with maintenance of an apparatus of a system for  
3       electrical power generation, transmission and distribution, wherein that the first data signal:  
4           is transmitted from a location of said electrical power generation, transmission and  
5       distribution system to an information system for said electrical power generation, transmission  
6       and distribution system and the first data signal comprises a graphic image representing a  
7       condition of said apparatus for maintenance purposes.

1           41. A second computer data signal embodied for communication in a computerized  
2       system, the communication being associated with maintenance of an apparatus of a system for  
3       electrical power generation, transmission and distribution, wherein that the second data signal:  
4               is transmitted from an information system for said electrical power generation,  
5       transmission and distribution system to a maintenance provider company and comprises  
6       information associated with a maintenance specification of said apparatus in the information  
7       system regarding a plan to provide maintenance for said apparatus.

8           42. A computer data signal as claimed in Claim 41, wherein that it is sent to a  
9       maintenance provider company and comprises information associated with a maintenance  
10      specification of said apparatus a request to purchase spare parts and/or replacement equipment  
11      for said apparatus.

12           43. A computer data signal as claimed in Claim 41, wherein that the information in  
13       said data signal comprises at least one part identifying said apparatus and one part identifying  
14       sender of the purchase request.

15           44. A computer data signal as claimed in Claim 41, wherein that the computer data  
16       signal is generated by an automatic maintenance providing procedure of the information system.

17           45. A computer data signal as claimed in Claim 41, wherein that the computerized  
18       system is adapted to create and send a purchase order to purchase, based on the computer data

1 signal, spare parts and/or replacement equipment.

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